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The Sparkling Nectar of Spas; or, Mineral Water as a Medically Commodifiable Material in the Province, 1770–1805

MATTHEW D. EDDY

Invitation to Peterhead

Here Health her bath's enlivening tide,
And fountain's sparkling nectar pours;
Fields fluctuate in flower pride,
While cool gales fan the quiet shores.
Her friendship warms, her smiles engage,
Her converse, quiet, learning, leisure,
Feed mirth, sooth care, afford the Sage
Instruction, and the Poet pleasure.

JAMES HAY BEATTIE, 1793, excerpt
from William Laing, *An Account of Peterhead,
Its Mineral Well, Air, and Neighbourhood*, 1793

A man may know the chymical analysis of all the articles in the materia medica, without being able properly to apply any one of them in the cure of diseases. One page of practical observations is worth a whole volume of chymical analysis. But where are such observations to be met with? Few physicians are in the situation to make them, and few still are qualified for such a task. It can only be accomplished by practitioners who reside at the fountains, and who, possessing minds superior to local prejudices, are capable of distinguishing diseases with accuracy, and of forming a sound judgment respecting the genuine effects of medicines.

WILLIAM BUCHAN, *Cautions Concerning Cold Bathing,
and Drinking the Mineral Waters*, 1786

I wish to thank Alistair Durie for giving me copies of several eighteenth-century spa-related texts and Andreas-Holger Maehle, Ursula Klein, and Pamela Anderson for sending me drafts of unpublished essays relevant to the subject matter of this chapter. I also received helpful suggestions from participants of the “Making of Materials” workshop hosted at the Max Planck Institute for the History of Science (Berlin) in August 2006. Finally, my understanding of eighteenth-century beliefs regarding the therapeutic value of heat and cold were enhanced by informal conversations with John Christie, Georgette Taylor, Hasok Chang, David M. Knight, and Robin F. Hendry at the “Matters of Substance” workshop held at Durham University in August 2006.

In recent decades historians have devoted a notable amount of research to the economic, social, and experimental relevance of the mineral water available for consumption in the spas that appeared across Europe from the seventeenth to the nineteenth centuries. Although studies have shed light on the links between tourism and commodification, the role of patient authority, and the isolation of chemical substances, they have not offered a clear account of how the chemical composition of the wells connected with the medical theory that legitimated their commodification and use as a remedy. In this chapter I address this gap by focusing on Peterhead Well, a provincial spa located on the northeastern tip of Scotland. In particular, I focus on several authors who wrote about the well, including Rev. Dr. William Laing, the local Episcopal priest. The spa was a popular northern health resort, and in 1793 the town's Freemason's Lodge celebrated the installation of a new pump room in which residents and visitors could enjoy a drink of the town's wine-colored water. After paying an admission fee, customers could sip at their leisure as they played card games and browsed the newspapers. Although the salubrious effects of the water had been known for centuries throughout the north of Scotland, Peterhead's new trading links to Holland, England, and the Baltic ensured the arrival of guests who knew nothing of the well's virtues. For these potential customers, and for incredulous Lowlanders to boot, William Laing wrote two pamphlets that used chemical analysis, personal testimony, and local case histories to substantiate the tonic power of the town's mineral well. The first, entitled *An Account of Peterhead* (1793), was printed by T. Evans in Pater-Noster-Row, London. It was sold in the capital, as well as in Peterhead, Aberdeen, and Edinburgh.¹ Over a decade later, in light of the commercial success of the well, Laing wrote a follow-up publication. Printed in Aberdeen by J. Chalmers, it was entitled *Account of the Cold and Warm Sea Baths at Peterhead* and went through two editions.²

Laing's publications bolstered the Lodge's attempt to make the water a material commodity. In particular, he identified several substances in it that were commonly known to have a therapeutic effect on the body. Indeed, his desire to connect both useful and commercial knowledge with scientific experimentation in this manner is similar to other material practices studied in this volume. In his case, he commodified the well's water by strategically appropriating practices and theories that were the domain of medical chemistry. As in the case of milk, dyestuffs, alcoholic spirits, and chemical remedies

1. Laing 1793b.

2. Laing 1804. Hereafter, *Sea Baths*.

(see Orland, Nieto-Galan, Spary, and Klein in this volume), his knowledge of the chemical composition of the well contributed significantly to its transformation into a commodity.³ Studies that address this facet of spa water are few, and the present work seeks to draw attention to this fact by addressing the material basis of spa water therapy as understood by literate Scots who lived during the late eighteenth century.

One notable obstacle that often prevents historians from pursuing detailed studies on provincial spa publications is the obscurity of the authors who wrote them. For example, other than the brief biographical summaries devoted to Laing in *Scottish Episcopal Clergy* and the *Fasti Academiae Mariscallanae Aberdonensis*, the contours of his life remain murky.⁴ Indeed, he does not even have an entry in the *Oxford Dictionary of National Biography*. The lack of such studies makes it difficult to explore how local practitioners became medical authorities, what kind of expertise they possessed, and how they used their knowledge to make mineral well water a therapeutic commodity. In Laing's case, the situation becomes even more intriguing when one considers that he was an ordained priest, practicing physician, and self-trained chemist. This being the case, this chapter uses Laing and several other frequenters of the well as examples of the complex world of pharmaceutical commodification. The first section unpacks why spa water was seen as a pharmaceutical commodity and how Laing acquired the necessary skills that allowed him to be a local medical authority. This is followed by a section that explains how chemistry was used to isolate substances that were widely known to have pharmacological value. The final section reveals how socio-economic factors influenced the interpretation of the water's therapeutic efficacy and its popularization in Scotland's print culture.

The Medical Context of Spa Water

SPA WATER AND MATERIA MEDICA

The medical marketplace was on the rise in the eighteenth century.⁵ Although the sale of naturally occurring "cures" was an ancient practice, the medical theories that governed the sale and use of drugs in Enlightenment

3. This approach to eighteenth-century pharmaceuticals is summarized in Curth 2006 and King 2006.

4. A basic outline of his vital dates and degrees appears in Bertie 2000 and P. Anderson 1889–1898.

5. Porter and Porter 1989. The standard work on the social and medical relevance of eighteenth-century spas is Porter 1990. For Scotland, see Durie 2003.

Scotland were significantly influenced by the chemical knowledge taught in schools and universities.⁶ This practice conformed to a larger European phenomenon during the eighteenth century in which the therapeutic value of tonics became inextricably tied to the rise of spa towns.⁷ With the rise of medical “chymistry” in the seventeenth century, it did not take long for physicians to combine chemical experimentation with pharmacology. By the 1700s, the pages of Europe’s leading scientific journals carried a wide array of articles that sought to connect the material content of the mineral water with therapeutics.⁸ As the century progressed, a plethora of books, monographs, articles, and chorographies were published on the chemical materials contained in mineral wells.⁹ In mainland Europe, two sites that were examined frequently were Carlsbad in Bohemia (modern-day Karlovy Vary) and Pyrmont in Lower Saxony. The same trend continued in Britain, and by the middle of the century there were numerous spa towns that promoted the therapeutic value of the chemical substances contained in their water. In England, the most famous were Bath and Bristol, but there were many mineral wells that were frequented by regional, national, and international tourists.¹⁰ In Scotland the relationship between therapeutics, chemical analysis, and spa water was commonly known among physicians and literate patients who lived in the last decades of the century. During this time, medically oriented articles or pamphlets were published on mineral wells such as Peterhead Spa, St Bernard’s Well, Moffat Spa, and Dunse-Spaw.¹¹

The common tactic of most chemically oriented spa literature was to isolate the material components of the water so that they could be identified and used to treat a disease. Although mineral waters were historically held to have medicinal properties, pharmacology in Enlightenment Scotland employed a chemical rationale to explain how the material composition of the water could be used therapeutically to restore health. This type of chemical pharmacology was in full swing by the 1750s, when the pharmacopoeias of

6. The chemical foundations of eighteenth-century pharmacology are also addressed in A. Simmons 2006; Klein 2007a, 2007b; Eddy 2005; Maehle 1999; Cook 1990.

7. See Porter 1990; Hembry 1990.

8. See Maehle 1999; Eddy 2001.

9. Coley 1982.

10. For the growth of eighteenth-century seaside resorts, including Brighton, see H. Robinson 1976, 3–13. The Georgian origins of modern spas and seaside resorts are summarized in Hassan 2003, 15–30, and in Corbin 1994, 57–96.

11. For a sample of these publications, see Taylor 1790 and Home 1751. For the experimental context that surrounded the interest in these wells, see Eddy 2001.

Edinburgh and London were translated from Latin into English.¹² The causative agent in a drug that instigated material change in the body was often called the “active principle.” Physicians sometimes linked this “power” to the concept of “elective affinity,” that is, the notion that certain kinds of chemical substances attract each other based upon a force (affinity) inherent in their material composition. For this reason, the concept of affinity was often explained in pharmacopoeias.¹³ There were many types of drugs that contained such active principles, but some of the more common were expectorants, diuretics, and tonics. The causal therapeutic powers of these drugs were linked to experiments conducted on animals and patients in the country’s leading universities and infirmaries. Most physicians, apothecaries, and surgeons who operated in these settings held that body tissue was made up of fibers that, depending on their composition, could be made to contract or relax. Contraction forced fluids out of the viscera and flesh, thereby making the body hard. Relaxation allowed fluids to seep in, thereby making it soft. Medical historians usually group the therapeutic theories that resulted from this physiological model under the term *neohumoralism* on account of their conceptual similarities to humoralism, the ancient and medieval medical theory which held that health was regulated through the use of fluids (black bile, yellow bile, phlegm, and blood). As intimated above, Scottish neohumoralism was closely linked to chemical powers attributed to different substances. If one wanted to maintain a healthy nervous system, one had to ensure that the tissues remained properly balanced between hardness and softness. When the body became imbalanced, drugs with specific types of active principles had to be used to restore the equilibrium.¹⁴

When it came to mineral wells, Scottish neohumoralism gave great weight to the therapeutic power of the tonics found in a spa’s water. The link between the tonic and its power was usually established by the testimonies of those who had imbibed the water. In Peterhead, such evidence came from case histories of Aberdeen Infirmary patients and the personal testimonies of spa denizens from both the affluent and common classes who held that the water had cured their nervous disorders. Tonics were closely connected to cures that stimulated or invigorated the nervous system, which, at the time, included not only the brain, spinal column, and nerves, but also muscles and tissues that are now considered to be part of the circulatory and digestive systems. William Cullen, an influential professor of medicine at the University

12. Cowen 2001.

13. A good example occurs in Lewis 1770, 27–29.

14. Neohumoralism is treated throughout Risse 2005 and 1992.

of Edinburgh, for instance, promoted what historians have called “a single and ultimately indivisible neuro-muscular system.”¹⁵ It was within this intellectual context that most literate Scots learned about the tonics contained in Scotland’s spa waters.

Laing’s publications indicate that his perception of the nervous system was similar to Cullen’s. In his first Peterhead pamphlet, he discussed nervous disorders that produced “lamentable affections both of body and mind, called *hypochondriacal* or *hysterical* disorders; which last complaint is usually nothing else than a debilitated stomach, in an irritable condition, disordered accidentally by passion, or some excess or irregularity.”¹⁶ Based upon his analysis of the well’s material contents, he held that Peterhead’s spa water could alleviate these nervous complaints. Overall, he was respectably acquainted with therapeutic theories used to calm the nervous system, and his comments on Peterhead’s tonic power over dropsy provide a particularly good example: “Dropsy also is a disease of debility; wherein the vessels exhaling a fluid into the various cavities of the body for moistening them, from weakness, as is supposed, allow too great a quantity of the fluid to escape through them; while the vessels that take up that fluid, and convey it again into the mass of blood, fail to do their office from want of power. This points out the propriety of Peterhead water, as a tonic and stimulant.”¹⁷

Because spa water contained naturally occurring therapeutic substances, there were many sources available to the reading public that explained and categorized their ameliorative contents. One of the most widely read books on the chemistry of spa water in Enlightenment Scotland was William Buchan’s *Domestic Medicine*.¹⁸ It was first published in 1769, and by 1802 it had gone through at least seventeen editions. As such a popular book, it had a considerable impact on the public’s understanding of the medical and chemical relevance of spas. The book classified the therapeutic substances of spa water into four categories: *ferruginous*, *gaseous*, *saline*, and *sulfurous*. These categories were directly linked to several irreducible chemical components that guided experimentation during the 1760s: water, metals (ferruginous matter, that is, a substance containing iron), airs (gaseous matter), inflammables (sulfurous matter), and salts (saline matter).¹⁹ This process of classifying the

15. The clearest explication of Cullen’s nervous theory that I have encountered is Bynum 1993.

16. Laing 1793b, 35.

17. *Ibid.*, 37–38.

18. Rosenberg 1983, 22–42. See also the quotation taken from Buchan’s *Domestic Medicine* that appears at the beginning of this chapter.

19. These principles are defined in Holmes 1989b.

content of spa water into categories that corresponded with chemical principles mirrored the practices used to categorize minerals and drugs in the medical courses given at Scottish universities.²⁰ Based on experiments and patient histories, drugs were associated with the specific substances of chemistry, thereby making matter theory an issue of personal relevance to many people.

Spa-related articles and pamphlets, both popular and academic, often focused on “salts,” that is, dissolvable material agents that bore acidic and alkaline properties.²¹ Identifying salts in this manner stretched back to the seventeenth century, when saline active principles became more associated with the notions of alkalinity and acidity as well as to specific types of therapeutic cures. In this context, the isolation of a salt from a sample of spa water often contributed to the water’s commodification. The practice of ingesting salts contained in spa water (and many other drugs) remained a dominant form of provincial therapeutics in Scotland until it was challenged by mid-eighteenth-century medical theories that placed more emphasis on the curative power of heat. This evolution stemmed from the fact that both chemistry and therapeutics were changing from the 1770s forward. In the years that followed the publication of Laing’s first pamphlet, the new chemistry of Antoine-Laurent Lavoisier began to be accepted throughout Europe, and medical theories based on body temperature enjoyed increasing popularity. In the wake of such changes numerous provincial works, Laing’s *Sea Baths* (1804) for example, gave more attention to temperature-based cures and the tonic power of hot and cold baths.

WILLIAM LAING: THE AUTHORITY
OF A CHEMICAL COMMODIFIER

Although well-known medical professors like the University of Edinburgh’s Joseph Black demonstrated a passing interest in the chemical content of Peterhead’s water, the main medical commodifiers of the spa were Laing, Rev. Dr. James Beattie, and Rev. Dr. George Moir. This means that the principal experts on its contents had not formally studied medicine in university. This might seem odd to modern eyes, but becoming a medical authority in

20. Eddy 2002, 2004, 2008.

21. Salts could also be isolated via simple distillation, which did not necessitate expensive chemical equipment. On a more academic scale, articles on salts appeared frequently in London’s *Philosophical Transactions* and Edinburgh’s *Essays Physical and Literary*; however, related articles also appeared in *The Scots Magazine*. For the role of acidity and alkalinity in spa water, see Monro 1770.

eighteenth-century Scotland was not a straightforward enterprise. In addition to studying in a university, one could be granted an MD on the basis of an outstanding medical publication, or through a plan of self-study that culminated in an oral examination in a university. Such a situation is notable, as it shows that the three local experts were not invested members of the medical establishment, which at the time was regulated by the Royal College of Physicians of Edinburgh and by those who held medically related professorships in the universities. Here I wish to explore this context in more detail by giving a focused account of Laing's eclectic medical education and by showing why his comments on the therapeutic value of the spa's substances was taken seriously by his contemporaries. I will return to the expertise of Beattie and Moir later in this chapter.

Laing was born in Fraserburgh, Scotland, on 29 March 1742. In 1762 he matriculated at Marischal College, Aberdeen. His studies were overseen by William Kennedy (Greek), Frances Skene (civil and natural history), George Skene (natural philosophy), and James Beattie (moral philosophy). In 1766 he was awarded an MA. While pursuing his studies, he developed a close relationship with Beattie, and they went on to become lifelong friends. Although the precise nature of Laing's initial exposure to medicine and chemistry is not known, it can be safely assumed that he initially learned about the subjects while in university. George Skene's lectures, for instance, promoted chemistry, especially the works of Herman Boerhaave, and its usefulness for mineralogy and the related fields of medicine, agriculture, and industry.²² It is also quite likely that Laing studied medicine with John Gregory. In addition to being Beattie's close friend and personal physician, Gregory was also the professor of medicine at King's College, Aberdeen, until 1764.²³ Upon graduating, Laing was appointed preceptor to William Fraser of Kirkton in Philorth and, with the help of Beattie, he was made Under Master of Aberdeen Grammar School in 1770.²⁴ He was ordained the next year, on Beattie's recommendation, into the Episcopal Church of Scotland by the Bishop of Down and Connor.²⁵ In the same year, he was appointed as minister to the English Episcopal Chapel in Peterhead and he remained there for the rest of his career.²⁶

22. Wood 1993, 91–94.

23. B. Ashworth 2003, 67–69.

24. P. Anderson 1897, 38–41.

25. Henderson 1907, 375–76.

26. Beattie 1771 (R. Robinson 2004, 248). I will make substantial use of the correspondence between Rev. Dr. William Laing and Rev. Dr. James Beattie. These letters are housed in several collections around Scotland, and many of them have been summarized and placed in a numbered list published in R. Robinson 2004. Whenever I cite a Laing or Beattie letter, I list the date

Over the next ten years, Laing continued to foster his interest in medicine by reading books and observing the ameliorative effects of Peterhead's waters.²⁷ In time he became proficient in medical theory and *materia medica*, and began to recommend remedies and cures to his parishioners and friends. As he did not hold an MD, he was not legally allowed to take payment for any of his medical advice. Beattie, however, visited Peterhead often, and was able to witness Laing's abilities first hand. He was so impressed with Laing's skills as an "adept in medicine" that he approached Alexander Donaldson, Marischal's professor of medicine, to see if his former student could be awarded an honorary "Doctor's degree in Physick." Although such a recommendation from a professor of moral philosophy might at first glance sound rather unusual, Beattie's knowledge of medical theory was by no means slight, and he was certainly qualified to assess Laing's abilities.²⁸ Based on Beattie's testimony, Donaldson agreed to support the measure and both professors presented Laing's case to the university. As a result of this petition, Laing was awarded an MD in October 1782.²⁹ The excited Beattie then wrote Laing of the good news: "I will *Mr Laing* you no more henceforth. You are now to all intents and purposes The Reverend Dr William Laing Doctor of Medicine—quod felix faustumque sit."³⁰ Laing took his MD seriously and thereafter continued to educate himself on medically related subjects. As I will explain below, his Peterhead work shows that he was keen on performing chemical experiments. He also was involved with community health efforts.³¹

Throughout the rest of his life, the wider Peterburgh community continued to hold Laing's medical abilities in high esteem. Beattie, for example, continued to affirm Laing's medical authority throughout the 1780s

that the letter was written and the number given to it in Robinson's list. All letters and their archival locations are listed at the end of the chapter.

27. Depending on a person's state of mind, reading books could be beneficial or harmful (see Johns 2000).

28. Beattie apparently did this as an act of benevolence and not on the direct request of Laing. Beattie's medical knowledge was clearly evinced in his correspondence, and his extensive reading on the nervous system undergirded much of his philosophy of mind—especially as expressed in his *Elements of Moral Science* (Beattie 1790–1793). He was also knowledgeable of chemistry, especially the works of Joseph Priestley (Beattie 1774, in R. Robinson 2004, 556).

29. For the context of such honorary, or irregular, degrees, see Johnston 1987.

30. This quotation and Beattie's involvement in obtaining Laing's MD are detailed in Beattie 1782 (R. Robinson 2004, 1081). The Latin phrase reads as follows in English: "May it bring you happiness and good fortune."

31. For example, Laing played a role in the introduction of smallpox inoculations (Beattie 1788a, in R. Robinson 2004, 1506).

and 1790s.³² Laing eventually became the Beattie family's personal physician when they visited Peterhead and this appointment motivated Beattie to express his approbation of Laing's medical expertise in a letter to Robert Arbuthnot: "Yet Dr Laing (of whose medical skill I have a very high opinion) is under no apprehensions, and assures me there is nothing the matter with him [Beattie's son] but weakness, which, being the effect of relaxation merely, good weather, fresh air, strengthening medicines and moderate exercise, will in time remove."³³

Laing's role as a local physician soon led him to become interested in the chemical composition of the town's well and he began to conduct his own experiments on the water. His pamphlets on the well, mentioned above, indicate that he was well-versed in medical chemistry, especially as promoted in the works of William Cullen, Torbern Bergman, Carl Linnaeus, and Thomas Beddoes. Near the end of the 1790s, he expanded his interests into the therapeutics of temperature and took care to read the works by Benjamin Thompson (Count Rumford), James Currie, and William Wright on the subject. These authors used recent developments in the chemistry of heat and coldness to reevaluate the therapeutic value of water. Laing's provincial interest in consulting such up-to-date chemical rationales emanated from the experimental mindset that permeated medical theory in Scotland. Indeed, even though histories of chemistry often portray the Chemical Revolution of the 1790s as a time of upheaval, the truth of the matter was that whenever a "new" substance was isolated or renamed, it was quickly appropriated for spa water analysis. Such a context explains why Laing's *Sea Baths* included a more serious discussion of temperature (that is, a substance directly relevant to Lavoisier's new notion "caloric"). This was the case not only for Laing's works, but for other local chemists throughout Scotland and Europe in general.³⁴

Laing's knowledge of *materia medica* was also enhanced and validated by the reading public's interest in the subject. The number of health-related periodicals and books were increasing in Britain at this time, thereby creat-

32. Beattie corresponded often with Laing about medical treatments and a variety of other topics (including politics, music, and poetry). Beattie also encouraged Laing's artistic interests in various ways, such as sending him a cello from Edinburgh and placing Laing in charge of two organs being constructed in Peterhead (Beattie 1772, in R. Robinson 2004, 335; Beattie 1773, in R. Robinson 2004, 372).

33. Beattie 1790 (R. Robinson 2004, 1631).

34. Coley (1982) addresses the rising popularity of fixed air, a new substance from the 1760s onward, throughout his article.

ing a more medically literate audience.³⁵ Discussions concerning the material basis of drugs appeared often in late eighteenth-century Scottish periodicals, handbooks, and even polite correspondence. The pages of local newspapers and the gentlemanly columns of *The Scots Magazine*, for example, were filled with chemically based suggestions about health and agriculture.³⁶ It was also common in Lowland Scotland for students and members of the public to learn medical chemistry by attending university courses on *materia medica*, purchasing their own pharmacopoeias, and reading articles in the periodic press.³⁷ Even books for young children and adolescents contained apothecary weight tables and conversion charts.³⁸ Many of these sources cited medical authorities like Cullen or Bergman, but, when it came to discussing the therapeutic value of local spa water, authors tended to give priority to observations that they had made themselves or that had been made by another respected local source. Laing was no exception to this narrative trend, and, aside from summarizing several patient histories, the bulk of the empirical evidence in his two pamphlets originated from his own observations.

Material Analysis and Commodification

LAING'S CHEMICAL EXPERIMENTS

When Laing published *An Account of Peterhead* in 1793, he was keen to connect the chemical composition of Peterhead Well to contemporary therapeutics so that the water could be commodified alongside the other tourist attractions of the town.³⁹ To isolate the material substances in the water, he turned to various contemporary forms of chemical analysis. Because he did not have easy access to the metrologically uniform instruments being produced in

35. Porter 1985. A basic knowledge of medical theory was often encouraged among polite members of British society (see Golinski 1992, 11–49).

36. To my knowledge, there is no definitive work on this topic. The chemical interests of the publishers are addressed throughout Eddy 2007 and 2009. For Scotland, the most helpful list of periodicals for the period appears in Craig 1931.

37. *The Scots Magazine* published a number of articles pertaining to chemistry every year. For example, the 1787 volume reprinted *Edinburgh Magazine*'s summary of the positions of the antiphlogistonists and phlogistonists. Obituaries of chemists were also given, including that of Lavoisier. See "Abridgement of M. Metherie's Retrospective View of the State of Natural Science for the Year 1787," 1787; "Account of M. Lavoisier," 1798; and "The Life of Antoine Laurent Lavoisier," 1798. The wider readership of chemistry is addressed in Golinski 1992.

38. Eddy 2009.

39. The commodification of health in eighteenth-century England is addressed in McKendrick, Brewer, and Plumb 1982. For Scotland, see Durie 2003.

metropolitan settings, he performed experiments using whatever his locality could provide. His descriptions of his experiments mention an eclectic array of common instruments, some of which were wine glasses, china cups, tin plates “tubulated” into retorts, glass retorts, glass bottles, siphons, a tin kettle, stoneware cups, and tobacco pipes for stirring.⁴⁰ He also used specialized glass instruments like Florence flasks and a Nooth’s apparatus that were employed by contemporary chemists of the time.⁴¹ As most of these common and specialized items were used regularly by apothecaries, it points to the key role that they played in nurturing chemistry outside large cities.⁴² Laing used his instruments in conjunction with heat and acids to study a variety of chemical processes, including distillation, filtration, crystallization, evaporation, deliquescence, calcination, and phlogistication.⁴³ With the help of gravimetric tabulation, he determined the number of grains of each substance contained in a twelve-pound avoirdupois sample.

Despite the ingenuity of his experiments, Laing denigrated the exactitude of his results. More specifically, he believed that time constraints and the “imperfection” of his apparatus had created some quantities that could not be replicated in future experiments on the water. Indeed, on the front page of his first Peterhead pamphlet, Laing honestly stated that “the analysis of mineral water is a matter of no little difficulty.” But, even so, he felt that some of his results could not have been “more accurately performed by another.”⁴⁴ As the other chapters in this volume demonstrate, this situation was not unique to Laing or to other rural-based physicians per se. The challenges arising from the complexity of material substances were quite common, and

40. It must be noted that this list is a bit more basic than types of apparatus that Peter Shaw’s *Enquiry* (1734) used for mineral water analysis. Shaw’s list is sometimes used by historians to discuss eighteenth-century chemical instruments. It is reprinted in Coley 1982, 128. For chemical experiments occurring outside university laboratory settings in Scotland, the Duke of Argyll’s instruments have received the most detailed attention. Many of them are cataloged in Emerson 2002.

41. The most well-known instrument used to impregnate water with fixed air was Nooth’s apparatus. It was made of glass and was fragile. The first one was designed in the mid-1770s and it soon became popular throughout Britain. At the start of his experiments, Laing had hoped to track the water’s quantity of fixed air by using a Nooth’s apparatus; however, to his consternation, it broke and he could not get it repaired. Coley (1982) also addresses instruments used to extract gases from mineral water. See also Brownrigg 1765.

42. Laing most probably obtained his instruments from James Arbuthnot, the local apothecary.

43. The experimental relevance of these processes is addressed in Multhaupt 1966; Holmes 1989b; Newman and Principe 2002; and Klein’s chapter in this volume.

44. Laing 1793b, 18.

it must not be forgotten that self-deprecation was a common rhetorical tool used in published works of this time period.⁴⁵ But setting rhetorical issues aside, most eighteenth-century chemists, Scottish or otherwise, dreamed of having better facilities and equipment. This was the case for many chemically minded improvement writers and for medical students.⁴⁶ Laing's humble protestations notwithstanding, he was able to do a great deal with the tools and the substances that he had in his possession. His inability to achieve the exactitude that he desired was less a matter of his skill and more of an issue of limited free time and the financial resources required to acquire and repair equipment.⁴⁷

Laing devoted the first one-third of *An Account of Peterhead* to recounting the experiments that he had performed on the water. He argued that several substances in the spa's water had therapeutic powers. In making this assertion, he was able to connect the materials in the water to chemical theories of illness and health that were being used by physicians in Scotland and elsewhere.⁴⁸ More specifically, he wrote that: "The medical effects of the Peterhead water, as of all other mineral waters, depend on a combination of various causes: but in so far as they depend purely on the water, they are founded chiefly on these three parts of it, the IRON, especially that part of it which is united to the *muriatic acid*, the COLD WATER, and the FIXED AIR."⁴⁹ With this statement, it can be seen that Laing wanted to emphasize that the medical effects of the water derived explicitly from its chemical composition. In addition to these three chemical components, he held that there were several other notable ingredients. In the end, Laing concluded that it contained the substances shown in table 8.1.

All of these substances were seen as commodifiable pharmaceutical simples that had significant therapeutic value at the time.⁵⁰ Isolating the spa's

45. These strategic literary practices are addressed throughout Golinski 1992.

46. For more on chemistry and its presence in improvement literature, see Eddy 2007; for the Royal Society of Medicine, see Risse 2005, 83–88.

47. Laing's time was monopolized by house repairs and by political and ecclesiastical responsibilities. This explains why it took him at least a year to write the first pamphlet (Beattie 1792, in R. Robinson 2004, 1769). Additionally, when his Nooth's apparatus broke, he could find no one to fix it and purchasing a new one would have been too expensive.

48. Two studies that address the interaction between medical theory and chemistry in Scotland are Maehle 1999 and Risse 2005. For another comparative view between Britain and Germany on this topic, see Maehle 2007.

49. The uppercase lettering in this quotation occurs in the original text written by Laing.

50. These substances appear in the pages of any early modern pharmacopoeia. A good reference work that lists the names, contents, and therapeutic value of eighteenth-century drugs is Estes 1990.

TABLE 8.1. Analysis of the water of Peterhead Well

| <i>Substance</i> | <i>Quantity</i> |
|------------------------------|-----------------|
| Aeriated iron | 3 grains |
| Muriated iron | 30 grains |
| Muriated lime | 7 grains |
| Siliceous earth | 2 grains |
| Gypsum | 2 grains |
| Glauber's salt | 13 grains |
| Common salt | 7 grains |
| Fixed air (CO ₂) | 83 1/6 cu. in. |

components in this manner, moreover, was commonly practiced in the texts that Laing cites in his pamphlets. Iron, fixed air (carbon dioxide), and coldness were known as tonics in most spa literature. Notably, two of these three materials mapped on directly to two types of spa water outlined in Buchan's widely read *Domestic Medicine*: ferruginous waters, which included iron; and gaseous waters, which included fixed air. The third category, cold waters, appealed to the rising value assigned to the therapeutic uses of "cold," which some held to be a substance called "frigoric." By flagging the presence of these three types of tonics, Laing was effectively highlighting what he believed to be the most salable contents of the water. In order to understand his rationale on this subject, more needs to be said about their therapeutic value.

THE THERAPEUTIC POWER OF MATERIALS

Although the medical relevance of metals has been generally overlooked by historians, they played a strong role in Enlightenment Scottish pharmacology.⁵¹ Iron in particular was thought to "constringe" bodily fibers.⁵² For those whose nerves needed strong stimulation, pure iron filings were administered in the form of a pill. But the easiest way to ingest iron was to drink it. Waters that contained iron were called "ferruginous" or "chalybeate" during the early modern period. Laing was not the first to realize that the Peterhead's water was chalybeate in nature; indeed, the presence of iron had been addressed by George Skene and Donald Monro during the 1770s.⁵³ All three of these men knew that, based on eighteenth-century chemistry, the only materials that could be fully dissolved in water were acidic or alkaline salts. If

51. The therapeutic use of metallic simples dates back to ancient times. See McCallum 1999 and Lewis 1770, 489–546.

52. Lewis 1770, 492.

53. Skene 1773; Monro 1770, 262, 278.

an acid was poured over pure iron, it produced a salt known as “vitriol of iron” (sometimes called “salt of iron”), that is, an acid which was combined with iron and which could be dissolved into water. Liquids that contained vitriol of iron could be made artificially or they could be obtained naturally via chalybeate spas. In his first pamphlet on Peterhead Well, Laing stated that the spa’s water contained one whole grain of salt of iron to the pint.⁵⁴ Such a dosage was considered to be just right for someone whose nerves had become too tense and needed to be loosened via a slight jolt of stimulation. Such an assertion also fit well with the mid-eighteenth-century belief in the tonic power of acidic mineral waters.

Gaseous water was an extremely popular experimental topic during the eighteenth century and it attracted the attention of leading chemists.⁵⁵ The tonic power of aerated waters was used for many diseases, two of the most common being a weakened nervous system (which caused sluggishness and inattention) and bladder stones.⁵⁶ In Edinburgh, Francis Home and Robert Whytt were particularly interested in them. Their early studies, however, assumed that the gas contained in the water was common air. After Joseph Black demonstrated the existence of “fixed air” in the 1750s,⁵⁷ William Cullen suggested that this new gas had tonic powers. Over the next three decades, mineral wells that contained fixed air were prescribed based upon the chemical impact they were thought to have upon the body. If aerated water could not be obtained naturally from mineral wells, it could be made artificially by mixing salts into distilled water or by using instruments to imbue water with fixed air. Some of Cullen’s students went so far as to suggest that the levels of fixed air in the body needed to be balanced like any other fluid if health was to be maintained.⁵⁸ Laing, on the other hand, was more conservative and stated, “I make no doubt that the tonic effect of fixed air lies much more in its rendering cold waters pleasant to taste, agreeable to the stomach, and easy to pass off, than in any strengthening power inherent in itself.”⁵⁹

Cold water was often treated as a tonic by Laing’s contemporaries. He does not reveal whether he thinks “cold” is a material or a property of a substance, an ambiguity that could very well be linked to the contested nomenclatural

54. The English Imperial troy grain at this time was 64.8 mg (Connor and Simpson 2004, 758).

55. Including Joseph Priestley. See Priestley 1772; Golinski 1992, chap.4.

56. Maehle 1999, 55–125.

57. Black 1756.

58. For the therapeutic relevance of fixed air, see Macbride 1764. This book went through multiple editions.

59. Laing 1793b, 22–23.

status of “heat” and “cold” at the time.⁶⁰ Even so, he held its tonic power to be similar to that expressed by iron and fixed air. In Scotland, the therapeutic power of coldness had been investigated by Cullen during the 1750s, especially in an essay that showed how evaporation facilitated a drop in temperature upon the surface of thermometer bulb.⁶¹ From this experiment, Cullen reasoned that “cold” could possibly invigorate the body, which meant that it was a tonic. Drawing from this work, his pupils pursued further physiological experiments which convinced them that perspiration cooled the body. Thus, sitting in a heated room or taking a walk in cool air, ironically, created a coldness that had a tonic power.⁶² Because most tonic remedies were taken orally, temperature-based cures were sometimes seen as being less invasive, and this contributed to their rise in popularity during the 1780s and 1790s.⁶³ This therapeutic shift engendered modifications in the way that mineral water was administered and, consequently, commodified. Although people continued to drink it, hot houses and cold baths were built on spa sites so that visitors could soak themselves in vaporous heat or cold water. Additionally another readily available medium for tonic coldness was the sea’s water and air. Laing’s first pamphlet on Peterhead Spa noted this trend, and his discussion of coldness focused more upon the town’s sea baths. He held that their extreme cold (48°F) contributed to health by “gently irritating [the body’s] nerves and blood vessels, and thereby producing that glow and sensible perspiration on the skin, which are so agreeable after cold bathing.”⁶⁴ For those unable or disinclined to bathe in seawater, Laing recommended the benefits of the cold sea air.⁶⁵ Laing noted that Peterhead’s cold baths ranged between 46°F and 48°F (the normal temperature of the sea) and the warm bath was heated to 96°F.

As mentioned above, Laing took a closer look at temperature-based therapeutics after he published *An Account of Peterhead*. His subsequent thoughts on this subject were influenced by James Currie’s *Medical Reports on the Ef-*

60. Chang 2002. See also the various sections on “cold” and “heat” in Chang 2006.

61. W. Cullen 1756. Cullen’s views on temperature (especially heat) are contextualized in Taylor 2006.

62. The experimental evidence for the tonic power of cold water, as investigated by Cullen’s students during the 1780s, is addressed briefly in Risse 2005, 84. Donald Monro, also a student of Cullen, addresses the “coldness” of Peterhead throughout Monro 1770. Theories of heat and health are addressed in Forrester 2000.

63. The recalibration of hot and cold cures also paralleled the rise of portable, accurate, and cheap thermometers. See Estes 1991.

64. Laing 1793b, 45.

65. Rustock 2002 addresses the therapeutic aspects of airs (meteorology) in chapter 5. Notably, Laing’s assessment of cold waters and airs is more optimistic than the strictures against extreme temperatures present in Buchan 1786 and 1788, 716–18.

fects of Water, Cold and Warm (1797).⁶⁶ This was one of the most authoritative texts during the late 1790s on the tonic and relaxatory powers of high and low temperatures. He also had read the works of Count Rumford, William Wright, and Thomas Beddoes.⁶⁷ Throughout both Peterhead pamphlets, Laing cites all four of these authorities. Though the temperature of aerial and aqueous fluids had a long therapeutic history, these works were written during the transition from the older principle-based classification system of chemistry to that proposed by Antoine Lavoisier and his colleagues. Like cold, heat (or caloric) was still treated as a therapeutic material during the 1790s. Laing competently discusses all of the foregoing sources in *Sea Baths* and relates their therapeutic conclusions to Peterhead's waters and airs. In doing so, he introduced names taken from the French nomenclature, thereby popularizing new chemical terms to locals and visitors who may not have previously encountered them.⁶⁸

The Socioeconomic Context of Material Authority

THE ECONOMICS OF PETERHEAD'S WATER

Like many spas in Enlightenment Europe, the mineral water of Peterhead had attracted local attention for several centuries. During the 1760s and 1770s, the city started to receive more visitors on account of improvements made to the country's roads and ports by the crown in response to the 1745 Rebellion. Positive tourist reports of its spa soon followed. For instance, in 1778 David Loch's *A Tour through Most of the Trading Towns and Villages of Scotland* stated that "[Peterhead] is the Scarborough of North Britain, and has excellent accommodation for bathing. The mineral waters are much in vogue, and the inhabitants obliging and industrious."⁶⁹ Laing's role as a local medical authority and his interest in Peterhead's spa water, therefore, occurred at a time when the well's contents could be accessed more easily by a rising number of visitors. As he relates in his pamphlets, the town of Peter-

66. Currie 1797. Currie's work on the therapeutics of heat and cold is addressed in Forrester 2000.

67. B. Thompson 1798, 1804; Wright 1786; Beddoes 1799. Notably, Currie, Beddoes, and Wright studied medicine in Edinburgh under Cullen and Black. For more on their thoughts on temperature, see W. Cullen 1756 and Black 1770—although it must be kept in mind that the latter source was a pirated edition of Black's lectures.

68. Two such terms were "carbonate of iron" and "sulfurated hydrogen" (Laing 1804, 10–11).

69. Loch 1778–1779, 120. This quotation is also contained in Loch 1778, 61.

head had rapidly expanded in recent years. From the 1770s to the 1790s it had doubled its size from a few hundred residents to a population of well over five hundred. Although the well had been a popular attraction for northern aristocrats, gentry, and wealthy professionals, the economic success of the town was largely dependent on its role as a base for fishing vessels and as a port for cargo ships arriving from Europe (Norway, Sweden, and Holland), England (Newcastle, Sunderland, and London), and Scotland (Leith and Inverness). With the rise in trade also came a much higher profile for Peterhead in Britain, and from the 1780s onward Edinburgh newspapers and the London *Times* ran stories about the port and its inhabitants. Like many such accounts, the brief reports praised the well's ameliorative effects but gave no clear indication as to how its contents connected with the medical theories that guided therapeutics; the same could be said for advertisements for the well in the local press.⁷⁰ Thus, Laing's unique contribution to the popularization effort was the fact that his research identified specific therapeutic substances that were relevant to the rising tide of medically literate readers of the late eighteenth century.

Peterhead's rising status within the shipping industry made it more convenient to visit and, correspondingly, more appealing to tourists. One of the leading local groups that sought to exploit this potential market was the town's Freemasons.⁷¹ In 1793 the society bought a plot of land adjacent to the well. Under the leadership of James Arbuthnot (junior), the town's apothecary, the society improved the facilities available to visitors. Because this investment was predicated upon the expectation of financial success, it should come as no surprise to see that Laing's first pamphlet appeared during the same year that the Freemasons began to seriously improve the well's facilities. His decision to commodify the well's contents was particularly well timed and followed a trend in which pamphlets and metropolitan newspaper reports served to popularize provincial spas and their facilities. While such publications were sometimes vague on dosage, Laing's pamphlet offered specific quantities. If someone simply wanted to be reinvigorated, he recommended bathing in the water and drinking one gill of it per day for six

70. See the Peterhead Spa articles in *Aberdeen Journal* for 22 July 1771 and 17 July 1775.

71. I have not been able to ascertain whether the Freemason's Lodge employed any other local physician to test the well's waters, nor whether they stocked the pump room's reading area with other types of medically relevant literature. For the interaction between Freemasonry and natural philosophy, see Elliot and Daniels 2006. The reading rooms of spas and the presence of spa pamphlets in reading libraries is briefly addressed in Grenby 2002, see especially pp. 24 and 31.

weeks.⁷² Because summer admission to the pump room cost one guinea and each bath cost a shilling, it is clear that the Freemason's Lodge benefited from the attention that Laing's pamphlet attracted to the well. Based on the salability of the work, it would seem that he succeeded in popularizing the site. After the initial order of one hundred copies sent to Peterhead sold rapidly, Laing's gout-stricken publisher was keen to have him publish more on the subject.⁷³ However, as mentioned earlier, *Sea Baths*, the supplement, did not appear until 1804 (mainly because Laing was too busy with his parish duties).

Because most of the paying visitors came from the middle and upper ranks of society, Laing was quick to mention that the well's clientele included "ladies and gentlemen," including "senators, judges, philosophers, military officers, clergy, [and] merchants."⁷⁴ Aside from the entrance fees, visitors had to pay for accommodation, meals, and entertainment, all of which benefited the local economy. Thus, while the spa's water was known to those in the north of Scotland, the circulated copies of Laing's pamphlet communicated a much more specific idea of the water's contents and the environment in which they could be enjoyed, thereby justifying the prices advertised in his essay. Such a situation benefited both Laing and the townspeople. Beattie summarized this viewpoint in a letter that he sent to Sir William Forbes in 1793: "Our friend Laing at Peterhead has, at Mr Arbuthnot's desire and mind, written an Account of Peterhead, its mineral water, air, and neighbourhood: it is a pamphlet of 80 pages closely printed; and I think will do honour to him and good to the publick; I hope too he shall get a little money by it. It is dedicated to the Merchant Maiden Hospital, who certainly ought to make him a handsome present, as his work can hardly fail to draw strangers to Peterhead, and so raise the value of their property."⁷⁵ Beattie's prediction soon came true. Two years later Peterhead's summer spa business was booming, and this motivated the Freemason's Lodge to add cold and warm baths, contiguous with the well, that used seawater on account of "the gentle stimulus of the saline particles applied to the nerves and vessels of the skin."⁷⁶ This use of hot

72. Laing 1793b, 49–50. A gill was a "measure of liquid capacity, being 1/16 of a pint, 1/4 of a mutchkin" (Connor and Simpson 2004, 758).

73. Despite the Aberdeen printer (Chalmers) of the pamphlet being crippled by gout, Beattie also mentioned that it was popular in the town (Beattie n.d., in R. Robinson 2004, 1804; Beattie 1793b, in R. Robinson 2004, 1820b). Once Chalmers recovered later in the year, he was keen to get Laing to write a supplement (Laing 1793a, in R. Robinson 2004, 1834).

74. Laing 1793b, 75.

75. Beattie 1793a (R. Robinson 2004, 1796).

76. Laing 1804, 18.

and cold baths drew on the temperature-based therapeutic theories outlined above and followed similar additions to other European spa towns (Bath and Carlsbad, for instance). By 1799 James Arbuthnot had installed a forty-foot by twenty-foot gentleman's bath and turned the Lodge into a pump room where visitors' nerves could be stimulated by drinking coffee or relaxed by listening to organ music. It was these additions that were discussed by Laing in the *Sea Baths* sections that addressed the temperature of the town's well, seawater, and air.

VARIETIES OF MATERIAL KNOWLEDGE

I have found no evidence of any major disputes that took place over the types of substances that the water actually contained. There was one point of contention, however, that exercised the pens of Peterhead's local experts. Although they all agreed on the value of the chemical materials contained in the water, they differed on the therapeutic power that such substances had over the human body. A few of these disagreements are worth noting, as they shed light on the social context that affected the way in which Laing's contemporaries, especially those who were not part of the medical establishment, interpreted the impact the well's material substances had upon the physiology of their own bodies.⁷⁷ In what remains of this chapter, therefore, I shall treat the varieties of material knowledge evinced in the writings of Laing, Professor James Beattie, and Rev. Dr. George Moir, with a view to show the individual interpretations that were attributed to the effects of the substances contained in the water, thereby highlighting three forms of therapeutic expertise that were guided by personal experience.

Beattie's knowledge of the well stemmed directly from the tonic power that water had over the many maladies that he and his family experienced.⁷⁸ Indeed, his oldest son, the poet James Hay Beattie, expressed the family's affection for the water in a poem that he wrote about the well in 1793. Entitled "Invitation to Peterhead," it extols the healthful virtues of the well's location and its "sparkling nectar."⁷⁹ Such a positive perception perhaps explains why

77. Late eighteenth-century academic disputes over the therapeutic effects of different drugs are addressed throughout Maehle 1999. The constant revaluation of the drugs contained in the Edinburgh pharmacopoeia is treated in David L. Cowen 1957, 1974, 1982, and 1985.

78. Beattie believed in the tonic power of Peterhead's water until the end of his life (Laing 1803, in R. Robinson 2004, 2031).

79. Laing 1793b, 78–79. An excerpt from this poem is quoted at the beginning of this chapter.

the senior Beattie drank much of the “nectar” over the course of his adult life. He was plagued by a weak and overworked nervous system that engendered headaches, a “windy” stomach, weak bowels, “depression of spirits,” and vertigo. During the Enlightenment, such disorders were often associated with intellectuals, as the process of intense thinking was thought to weaken the nerves.⁸⁰ Additionally, his youngest son, Montagu, was sickly as a child and his wife, Mary, suffered from a nervous disorder that eventually led her to be committed to an asylum.⁸¹ The entire family, then, suffered from nervous disorders that justified the use of the water.

The Beattie physicians were John Gregory, George Skene, Thomas Livingston (physician to the Aberdeen Infirmary), and Laing. As was common, the Beatties were prescribed spa water for their nervous conditions. Laing even used James Beattie (whom he called the “benevolent Dr B***”) as one of his “nervous” case histories in the first Peterhead pamphlet.⁸² Although he was familiar with the waters of Tunbridge, Pitcaithly, and Pannoninch, Beattie’s letters repeatedly emphasized that he preferred the salubrious effects of Peterhead’s water and the air of its surrounding environment. Based on the tonic power that the iron and fixed air in the water had on his viscera and flesh, Beattie drank the spa’s “nectar” and occasionally bathed in it as well.⁸³ After a few comments about his past use of the water, he outlined his personal therapeutic approach in a letter written to Sir William Forbes in 1788: “Instead of taking it with an empty stomach and exercise after it, which is the established method, I drink it at six in the evening, at going to bed, and between three and four in the morning, sleeping after it. It has produced one symptom [flatulence], which every body tells me is a favourable one . . . and I am upon the whole much better.”⁸⁴ Here we can see that he had confidence in his own testimony over the water’s ameliorative powers—so much so that he felt that he understood the *effects* of the water well enough to medicate himself. The medical theory behind this decision was undoubtedly taken from what he had read and from conversations with his physicians. The ultimate authority, however, rested with Beattie, and his case serves as an informative example of the way in which patients

80. The context of this intellectual condition is treated in Porter 1991; Rousseau 2004; and Böhme and Böhme 1983.

81. R. Robinson 1996.

82. Laing 1793b, 72.

83. References to his drinking and bathing in the water are made throughout his correspondence from the 1760s up until his death. An outline of his health (and that of Mary Beattie) is given in the introduction to R. Robinson 2004.

84. Beattie 1788b (R. Robinson 2004, 1499).

played a respected role in therapeutics on the eve of the onset of clinical medicine.

Whereas Beattie is representative of those polite spa denizens familiar with medical theory who drank the water according to their own interpretation, Laing is more representative of eighteenth-century physicians whose livelihood required that they at least mention the relationship between the contents of spa water and the therapeutic theories promoted by the medical establishment.⁸⁵ This being the case, Laing gave a select handful of examples of instances in which the contents of the water had ameliorated some of his own nervous conditions as well as those of a few townspeople.⁸⁶ But he did not comb the town's streets and infirmary wards to compile an exhaustive list of case histories. There were two main reasons for this, and both shed light on the intended readership of his pamphlets. First, his retelling of the physiological effects of the water's contents followed the familiar format of the brief patient histories used by physicians to relate the therapeutic power of pharmaceutical simples and compounds in academic journals like Edinburgh's *Essays and Observations Literary and Physical*, popular periodicals like *The Scots Magazine*, and successful self-help medical handbooks like Buchan's *Domestic Medicine*. The readers of these publications were usually satisfied with one or two clear examples. That is to say, Laing's testimonial format would have been familiar to both academic and common readers. Second, Laing clearly believed that the mere identification of the individual tonics, especially iron, was sufficient evidence for an audience already familiar with the power that contemporary medical theory attributed to such substances. This explains why he did not offer a detailed account of the theories that underlay their physiological impact (as an introductory medical text might do). When it came to pharmaceuticals, Laing's readers did not need to be given detailed patient histories, because they were already familiar with the medicalized presentation of the effects of drugs (and their material contents) that permeated Scottish print culture.

Though Laing's analysis of the water's content was not seriously challenged, his interpretation of the effect of the tonics attracted some criticism. In particular, Rev. Dr. George Moir took issue with Laing's comments on the spa.⁸⁷ As well as being the Presbyterian minister of the town, Moir also held

85. The nature and efficacy of the therapeutic treatments in Edinburgh's Royal Infirmary are addressed in Risse 1986 and Tröhler 2000.

86. Laing 1793b, 4. Elsewhere, in his section "Of disorders that required strengthening," he states that the water had cured a woman who suffered from the "sinking of the spirits" and convulsions (that is, two nervous disorders) (Laing 1793b, 35).

87. Moir 1791–1799.

an MD from Aberdeen. His interest in the chemistry of the well stretched back at least to 1773, when he had corresponded with Joseph Black about the chemical composition of the water.⁸⁸ Moir accepted Laing's chemical analysis of the well's composition but disagreed with the therapeutic effect that Laing had assigned to it: "This water has long been deservedly in repute, for general debility, disorders of the stomach and bowels, flatulencies and indigestion, nervous complaints which flow from these causes, and diseases peculiar to the fair sex; and in all these disorders, I can from 30 years of observation and experience affirm, I know of no remedy no more efficacious."⁸⁹ Having established himself as a local authority, Moir unabashedly criticized the therapeutic value that Laing had attributed to the metallic and gaseous tonics in the water. Moir opposed the stimulatory power of tonics as being too harsh, favoring instead the relaxatory effect of diuretics, diluents, fomentations, and opiates. That is to say, he was not attacking Laing's views per se; rather, he was challenging the stimulatory theory of tonics upon which they were based. To challenge Laing, Moir used evidence gathered from local patient histories (especially on dropsy) and from Francis Home's *Clinical Experiments*. Home taught *materia medica* at the University of Edinburgh from the 1760s to the 1790s and preferred the use of laxatives, diuretics, and deobstruents.⁹⁰ In challenging the use of the tonics found in Peterhead's well, Moir was voicing a turn against stimulants that was moving through the Scottish medical community during the 1780s and 1790s (especially after Cullen's death in 1790).⁹¹ In addition to these relaxatory alternatives, Moir also asserted that the therapeutic value of bathing was inhibited in Peterhead because it lacked a "warm bath, and a bathing machine on the sea-beach."⁹²

Although his criticism of tonics was well grounded in medical theory, Moir gave little attention to Laing's comments on cold water sea bathing. This oversight might possibly be linked to differing political opinions and not the specifics of medical theory.⁹³ Laing, however, took care to respond to Moir's criticisms when he published *Sea Baths* in 1804. There he used the chemis-

88. Moir 1773. He also sent Black a sample of the water.

89. Moir 1791–1799.

90. Home 1780. Home thought that stimulants were too harsh on the viscera of the body.

91. Cullen's therapeutic practices were under attack by the followers of John Brown ("Burnonians") at this time. They challenged the analogical and inductive links that had been made between chemical substances (including heat and cold) and the cures engendered by drugs (Bynum and Porter 1988).

92. For more on the social placement of the Moir-Laing "debate," see Durie 2003, 212–13.

93. Moir engaged in a heated war of words with Laing and Beattie during the 1780s in a disagreement over nonjurors (Laing 1788, in R. Robinson 2004, 1540).

try of heat, especially observations based on Currie's work on the subject, to counter Moir's accusation that he did not properly understand the therapeutic value of using heated or cooled water. Although he did not specifically state Moir's name, Laing strongly criticized the "wrong direction" given by other local "advisers" who offered poor advice on account of their ill knowledge of the medical theory behind temperature-based therapeutics.⁹⁴ Thus, again, the dispute was not over the contents of the water. Nor was it over the types of instruments used to ascertain temperature. The real disagreement concerned the question of how the tonic affected the body—something that could not be easily resolved merely through the use of a test tube.

Conclusion

In this chapter I have addressed how Rev. Dr. William Laing and other local authorities contributed to the commodification of the water of Peterhead Spa by linking its chemical analysis to medical theory. This process was guided by Laing's heterogeneous expertise as a physician and chemist, as well as by the economic rise of the city of Peterhead in the last third of the eighteenth century. In particular, I showed that Laing's role as a medical authority also qualified him to be a local expert who used chemistry to isolate and measure the iron, fixed air, and "cold" that was present in the well's water. All of the substances were tonics that, according to late eighteenth-century medical theory, were held to have an ameliorative effect on the viscera and flesh of the body. Thus, in using chemistry to identify these materials—the "sparkling nectar," so to speak—Laing was effectively participating in a wider story of commodification that gripped many provincial European spas at the time. But whereas his conclusions over the content of the well were generally accepted by his provincial contemporaries, his views concerning the therapeutic value of the materials were subject to debate. Such a situation mirrored the pharmacological disagreements on this subject that were occurring at the same time in academic medicine. As mentioned throughout the chapter, leading physicians like Cullen and Home concurred that chemically isolated materials were therapeutically viable, but they could not agree on how such cures were best put to use. While their theories were applied in different ways by local authorities like Laing, Beattie, and Moir, all of the authorities under discussion in this chapter operated under the assumption that the neohumoralist framework was essentially correct, thereby creating a shared canon of sources and ideas by which they could discuss the material contents of the

94. Laing 1804, 15–16.

well. No matter which stance a local expert took on the therapeutic power of the substances in the water, however, the fact that Laing's pamphlet was just one of a plethora of contemporary publications that addressed the chemical composition of spa water shows that their commodification was linked not only to the material knowledge of the local authors, but also to that of a medically literate audience that was at least familiar with the chemical nomenclature of the day.

Primary Sources

Secondary sources can be found in the cumulative bibliography at the end of the book.

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Abbreviations

AUL: Aberdeen University Library

EUL: Edinburgh University Library

NLS: National Library of Scotland

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Between Market and Laboratory

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